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EXPRESSION AND ECONOMIC IMPACT OF INNOVATIVENESS IN THE TOURISM SECTOR

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Abstract. The expression of innovation is captured in increasingly diverse processes. Both technological and non-technological innovations are applied. This is because tourism businesses need to adapt to changing market conditions and to offer a new generation of modern services. Qualitative changes in tourism activities due to the availability of technology for the general public also lead to an increasing degree of self-service when organising a trip, which inevitably affects changes in the number of jobs created by tourism and the distribution of income in tourism and tourism-related industries. By treating the current stage of tourism globalization as a stage of globalization based on information dissemination and image engineering, where countries compete for the efficiency of information dissemination, it is important to objectively assess the extent to which tourism innovativeness enhances the economic benefits of tourism. The aim of the research is to evaluate the economic impact caused by tourism innovativeness on the basis of the latest trends in the expression of tourism innovativeness. Regression analysis revealed that in 2012-2017, the indicators of tourism innovation had a direct and indirect economic impact.

Keywords: tourism innovativeness, expression of innovativeness, economic impact, assessment of economic impact, tourism development.

JEL Classification: O11, Z30, Z32.

Introduction

The services sector is developing intensively. Changes in the demand generated by innovative consumers also lead to transformations in the tourism sector. Tourism is changing fundamentally. Total spending on tourism is increasing, but the amount of money spent per travel is decreasing. Due to the changed needs of consumers, the demand for innovation consumption is increasing, which in turn encourages the tourism sector to innovate. The development of consumer-driven innovativeness in the tourism sector becomes possible by the rapid development of advanced technologies and the falling cost of technology. Innovativeness creates benefits for consumers and businesses. The results of the study conducted by "General Electrics" (2017) reveal that in the next 10 years innovativeness will improve the quality of the population in 4 areas: communications, health, job market, and environmental quality. Businesses respond to changes in

the demand for innovation and it helps to achieve better economic results. Even though many countries ascribe tourism to a priority industry and invest heavily in innovativeness in tourism business, there are no methodologies for the evaluation of the economic impact of innovativeness in the tourism sector.

The aim of the research is to evaluate the economic impact on capital investments caused by tourism innovativeness on the basis of the latest trends in its expression.

The object of the research is the economic impact of tourism innovativeness.

The research objectives:

1. To analyse the expression of innovation in the tourism sector.

2. To establish the directions for the evaluation of the economic impact of tourism innovativeness.

3. To evaluate of the economic impact of tourism innovativeness on capital investments by using correlation analysis and modelling of structural equations.

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Research methodology: in the course of the research, the methods of analysis, synthesis, aggregation, and comparison are used to analyse the theoretical scientific material. The research method of descriptive statistics is used for the analysis of the latest trends in the tourism sector. The research methods of correlation, regression, and structural equations modelling are used to verify the evaluation model of the economic impact of tourism innovativeness.

1. Expression of innovation in the tourism sector

There are very few studies that analyse innovation in both the services sector in general and the tourism sector in particular, given the complexity of assessing ICT innovation and its economic benefits in the services and tourism sectors. In the literature analysing the tourism sector and the expression of innovation in it, innovations are defined on the basis of five categories (Mei et al., 2011):

– Service or product innovation: changes that the consumer perceives as new;
– Process innovations: new or highly improved methods covering both production and delivery processes aimed at increasing efficiency and productivity;
– Management and organizational innovations: new or significantly improved ways of internal cooperation related to the company's business practices ways of organizing internal cooperation related to the company's business practices, workplace or organization of external relations;
– Marketing innovations: new or highly improved marketing methods;
– Institutional innovation: a new or improved cooperation / organizational structure and legal framework that improves the business environment for tourism.

Sometimes the expression of innovation and its differences may seem larger within the service sector itself than between different sectors, as services and their types vary greatly across different service areas. Cross-sectoral cooperation is crucial, as innovation-driven economic growth is only possible when cross-sectoral synergies occur. Internet technologies as innovations can be transformed into innovation and economic growth as other industries start using and improving new technologies. In this cross-sectoral innovation process, tourism companies have the potential to turn high-tech innovation developed in other sectors into economic growth. Rapid technological development in other sectors (transport, IT, work organization, etc.) also has a significant impact on changes in the tourism sector. The tourism sector has become one of the most important and fastest growing e-business sectors by adapting and integrating technological innovation (Chen et al., 2009; Cooper & Wahab, 2005; Sundbo et al., 2007; Decelle, 2006). The tourism sector uses technological innovations from other sectors, such as special tourism equipment based on state-of-the-art materials, hotel

climate control systems, electronic manuals, satellite navigation systems, computer systems management and accounting, electronic advertising and commerce (Alla & Mykhaylo, 2017). The development of innovation in the tourism sector is not a new trend. The whole evolution of tourism is based on innovation. Tourism was influenced by the invention of the railway, the popularity of credit cards, and the creation of new pilgrimage centres. Processes and products in the tourism sector continue to be constantly modified. Companies in the tourism sector are increasingly engaging in innovative activities that not only support growth but also help them adapt to the changing nature and scale of global environmental change (Bell & Ruhanen, 2016). The supply of innovative tourism products increases a firm's competition in the market (Sivadas & Dwyer, 2000; Lebe et al., 2014). It is pointed out that greater value and competitiveness are also crucial for consumer participation in innovation activities. Innovative services, in which the customer has been involved, provide a higher unique value to the consumer compared to those created by the service provider alone. The tourism sector is based on extremely close cooperation between the consumer and the service provider, therefore tourism innovation is characterized by the involvement of the consumer in the activities of increasing innovation and the production of services based on it.

The development of innovation is also due to changed social models, improved education, new culture, lifestyle and so on. The increase in innovation in the tourism sector is determined by the growing importance of infrastructure and information and communication technologies in society (Kozak, 2017). Innovation in the tourism sector is increased in order to increase the quality of customer service and increase added value (Gyurácz-Németh et al., 2013; Makgopa, 2021). The use of innovative technologies in the tourism sector makes it possible to offer the consumer personalized services that meet consumer demand very precisely. This increases competitiveness, maintains market share compared to other intermediaries and distribution channels, and provides economic benefits (Tsiotsou et al., 2010; Blum, 2021). Increasing innovation through the application of information and communication technologies in the tourism sector increases the value of the service to consumers at all stages of the tourism process: finding information, making a decision, planning a trip and purchasing tourism services and products. Technology gives tourists flexibility and convenience as the consumer receives detailed information without much effort and intermediaries. Each user can follow news on social media, get information about popular places, and share their experiences with other users of tourism services (Tanrisever et al., 2016). With innovative technological tools, it is extremely easy to find information at any time about where to travel, how to organize trips in advance, how to manage them. Users can manage reservations, maps, tickets, communicate with the service provider, etc. in real time. (Tovmasyan, 2016). Such processes also increase the bargaining power of users of tourism services,

as the management and control of the service shifts to the area of consumer interest.

On the other hand, the introduction of innovative technologies helps tourism service providers to analyse tourist purchase patterns, profiles and preferences. The introduction of mobile communication technologies and the development of smart devices in the delivery of tourism services are becoming increasingly important. Many tourism products are becoming integrated with mobile applications (Peppers & Rogers, 2007). The application of technology improves the visibility of tourism services to consumers, helps to position and strengthens the attractiveness of the region. The increase of innovation, adaptation to consumer demand has a significant impact on the development of tourism in the future (Chen et al., 2009). Tourism will continue to expand in the future, innovation will increase. The Internet has a major impact on the development of tourism and these trends will continue in the future due to the penetration of technology.

The expression of innovation in the tourism sector is evolving depending on technological possibilities. First of all, innovation (as an innovation complex) was adapted for the convenience of the user, later the advantages for the service provider – management of communication processes between the user and the customer – were taken into account. Later, the innovation was applicable exclusively to increase the efficiency of the supplier's operations – to manage administrative processes. This means that the penetration of innovation is increasing in order to fully improve the user experience.

Internet technologies are used to increase user convenience, increase added value for the customer. In the tourism sector, innovation is most often applied through a complex of innovations (online platforms).

The Internet becomes accessible not only from the computer, but also from other smart devices, such as tablets, smartphones, other technological solutions. Consumers are increasingly using smart devices. For even greater user-friendliness, content is being adapted for smaller, mobile devices.

One other manifestation of innovation in the tourism sector is virtual communities. Virtual communities are both treated as innovation and promote a different increase in innovation in the tourism sector. Virtual communities allow people to communicate to meet their needs for both information and sharing. Such a process provides a reason for a community to exist. Online applications and online rankings and commentary websites are becoming popular among virtual communities. In addition, the use of videos and panoramic photos when ordering online is becoming more common. Priority is given to sustainable tourism, taking into account the ecological concept of tourism. This is often facilitated by innovative technologies (Alla & Mykhaylo, 2017; Opazo-Basáez et al., 2021). Innovation in the tourism sector, enabled by technology, not only helps to realize the potential of sustainable tourism, but is also important in other respects. For example, the expansion of tourism services by geographical area is

relevant. This helps to personalize the offers to the target user. Geographical application of services is a way to inform tourism users about their environment, the specifics of tourism services, to provide other useful information depending on the geographical location of the user. It is also possible to combine the services of several companies into one service – package (Alsos et al., 2014), for example, city walks and bicycle paths with stops in cooperating companies. Networks provide an opportunity to co-create and transfer knowledge between firms, as well as creating a sense of trust (Jernsand et al., 2015; Moretz et al., 2022).

The definition and theory of innovation in the tourism sector is linked to the general directions of innovation research. The tourism sector is closely interlinked with other industries, so mutual symbiosis is crucial for tourism innovation. The tourism sector accepts and adapts innovations created by other sectors, thus creating innovation that leads to greater added value for the consumer. The development of innovation in the tourism sector is taking place due to changing technologies, infrastructure, and education, social changes, and so on. The expression of innovation in the tourism sector is based on the improvement of services through modern information technologies. First, computer reservation systems were introduced, which optimized and accelerated the work of service providers. Later, the development of the Internet facilitated communication between tourism service providers and consumers. A new form of communication has emerged – communication between users using information technology. This has changed the consumption of tourism services from a business-to-consumer perspective to two-way communication, which has led to changes in marketing, transformations in the services provided, and economic change. Consumers have benefited immensely from being able to access more information, make the right decisions and contact the service provider in an instant. Recent trends in the expression of tourism innovation reveal that not only the Internet but also the Internet network is enabled for mobile devices. In this way, significant added value for the consumer is created, and the user's needs are more precisely identified and met. Due to the added value for the consumer, tourism companies, regions have a greater potential for positive economic change.

2. Directions for the evaluation of the economic impact of tourism innovativeness

The definition and theory of innovativeness in the tourism sector are related to the general directions of research on innovativeness. Tourism sector is closely linked to other industries, thus mutual symbiosis is crucial. Tourism sector accepts and adapts innovations created by other sectors, thereby creating innovativeness that leads to greater added value for the consumer.

The development of innovativeness in the tourism sector occurs due to changing technologies, changes in infrastructure and education, social changes, etc. (Kozak, 2017). The expression of innovation in the tourism sector

is based on the improvement of services through modern information technologies.

Innovativeness in the tourism sector has been expressed through content management systems, enabling users to generate content. Later, innovativeness has started to be used as a relations management systems to manage communication between the user and the service provider. Most recently, innovativeness has been introduced as an administrative solution to optimise the processes of a tourism service provider.

Computer applications, Internet platforms or mobile applications integrate Internet content on a device used by a consumer, in addition to the technical capabilities of the consumer's mobile device (Bilgihan & Nejad, 2015; Rodriguez et al., 2014). As follows, significant additional added value for consumer is created, consumer's needs are more precisely identified and met. Due to the additional added value for the consumer, tourism companies and regions have greater potential for positive economic changes.

Factors and trends of tourism development and areas of the economic impact. The tourism sector is affected by constant changes in the environment, shaping new demand for tourism. The following factors that change tourist behaviour and tourism demand are distinguished: technological (Tanrisever et al., 2016); political (Demiralay, 2020; Ghalia et al., 2019); demographic, socioeconomic (Tanrisever et al., 2016); and other. New types of tourism are emerging, such as leisure and holiday tourism, business tourism, cultural tourism, ecotourism, heritage tourism, rural tourism, study tourism, religious pilgrimage tourism, spa tourism, medical tourism, visiting friends and relatives, agro-tourism, sports tourism, etc. (De la Hoz-Correa et al., 2017; Paresishvili et al., 2017).

The change in the trends of tourism has an economic impact. The following directions of the economic impact of tourism are distinguished: investment, job creation, national product, the country's balance of payments, and levelling function.

The economic impact of innovativeness is evaluated in one of the three directions: by evaluating the inputs of innovativeness, by evaluating the microeconomic impact or by evaluating the macroeconomic impact.

The most popular direction for the evaluation of the economic impact of innovativeness is by evaluating the inputs of innovativeness, i.e. expenditure on R&D, number of patents, number of scientific articles, number and duration of implemented innovations, number of staff trainings, various indices of innovativeness and other objectively measurable indicators (Frietsch & Schmoch, 2006; Knowles et al., 2008; Kamaruddeen et al., 2009). This evaluation direction measures only innovativeness, but there is a lack of indicators on the results of innovativeness, thus the economic effect is not emphasised.

The direction of the microeconomic impact evaluates the economic impact of innovativeness at the micro level, i.e. at the level of a company (Lin et al., 2020; Mendoza-Silva, 2021; Sandvik et al., 2014). Innovativeness is described as an increase in the quality of goods and services, a share of sales of innovative products. The economic impact is evaluated on the basis of the following indicators: increase in income, increase in market value and share, increase in profitability.

The third direction of the evaluation of the macroeconomic impact of innovativeness analyses: the impact of the number of innovative companies and employment in knowledge-adoptive sectors on GDP, foreign direct investment, the rate of unemployment, the establishment of new companies, export, market share (Bazhal, 2017; Zervas et al., 2017). Although this direction of the economic evaluation of innovativeness is the broadest, indicators of innovativeness are questionable because they emphasise innovation inputs, the environment of innovativeness, and the created opportunities to implement innovativeness, but they do not identify and do not evaluate innovativeness.

All the directions for the evaluation of the economic impact of innovativeness are not bound to one particular sector. The discussed evaluation directions and indicators can also be used to evaluate the economic impact of tourism innovativeness.

3. Research methodology

Researchers from different countries are analysing the innovativeness of tourism. There are studies that examine the effects of innovativeness and innovation behaviour on tourism SMEs' performance (Shpresim et al., 2019), innovativeness and control mechanisms in tourism and hospitality family firms (Kallmuenzer & Peters, 2018), the influence of tourism innovativeness on online consumer behaviour (Couture et al., 2015).

This study aims to assess the innovativeness of tourism at the level of European countries. The study aims to determine which indicators of tourism innovativeness have an impact on capital investment. The process of economic impact assessment of tourism innovation consists of four stages:
  – selection of the indicators;
  – correlation analysis;
  – regression analysis;
  – modelling of structural equations.

Selection of the indicators. 21 tourism innovativeness indicators were selected. The sample size of the study includes data from 30 European countries, following similar statistical calculation practices and methodologies (Austria, Belgium, Bulgaria, Cyprus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Romania, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Norway, Switzerland), in the timeframe of 2012–2017. The data are available in Eurostat, UNWTO and other databases.

Correlation analysis. In order to identify economic innovation indicators with an economic impact, the most

appropriate method is correlation analysis of selected indicators. Correlation analysis is a statistical method used to estimate the strength of a relationship between two quantitative variables. A high correlation means that two or more variables have a strong relationship to each other, and a weak correlation means that the variables are not very related. The correlation coefficient r ranges between −1 and +1 when the perfect correlation is ±1 and 0 is the absence of correlations. R values from 0 to 1 reflect a partial correlation, which may or may not be significant. When the data are parametric and distributed normally, Pearson moment correlation is used (Gagne, 2014). For abnormal distributions (for data with extremes of extremes), correlation coefficients should be calculated by data groups rather than by their actual values. Spearman's rho (denoted by rs) and Kendall's Tau coefficients (Akoglu, 2018) were developed for this purpose. The correlation coefficient shows whether the linear dependence of the measured variables is strong. SPSS software is used for correlation analysis.

Regression analysis. Regression analysis is a study to determine how the response variable depends on one or more characteristics (Smelser & Baltes, 2001). Regression analysis determines the relationship between two sets of values: independent and dependent variables. This type of analysis focuses on the relationship between these two sets of values and helps to understand how the typical value of a dependent variable changes when any of the independent variables change. After eliminating the cases of multicollinearity, 5 indicators of tourism innovation were statistically significantly correlated:

- air transport infrastructure index;
- innovation penetration index of transport and accommodation companies;
- number of ICT specialists employed;
- self-service grade index;
- digital country index.

Modelling of structural equations. The purpose of modelling structural equations is to test hypothetical causal relationships between structural parameters. It is a useful multidimensional research technique that includes regression, factor analysis, and analysis of variance to simultaneously evaluate interrelated relationships.

4. Impact of tourism innovativeness on capital investment in the tourism sector

Discussing the results of the study, tourism innovation indicators with a statistically significant relationship with capital investment are presented:

- air transport infrastructure index;
- innovation penetration index of transport and accommodation companies;
- number of ICT specialists employed;
- self-service grade index;
- digital country index.

2012–2017 capital investment in the tourism sector correlated (when $p < 0.01$) with air transport infrastructure ($r = 0.526–0.5674$), the number of employed ICT specialists ($r = 0.857–0.901$), the degree of self-service ($r = 0.793–0.907$), digital country index ($r = 0.817–0.864$). A correlation was also found with the number of tourists staying ($r = 0.852–0.835$), the number of accommodation establishments ($r = 0.857–0.867$), the number of rooms ($r = 0.839–0.865$) and the number of beds ($r = 0.830–0.865$) in accommodation establishments, the number of people staying in all types of accommodation establishments ($r = 0.904–0.939$) and the number of tourists staying in private accommodation establishments ($r = 0.781–0.868$). 2012–2017 correlations were similar in different years, no significant differences were recorded.

The regression analysis revealed that the regression indicators for 2012–2017. were statistically significant and similar (see Table 2). The value of the corrected coefficient of determination R^2 in 2012–2017 was close to one ($R^2 = 0.832–0.886$), the relationship is strong. The national index of the number and number of employed ICT specialists and the number of digits explain the capital investment in the tourism sector by 83–89% accuracy.

Regression equations for 2012–2017 were similar:

$$y(2012) = 0.198 + 0.479\log(iss3) - 0.698\log(iss5); \quad (1)$$

$$y(2013) = -8.953 + 0.494\log(iss3) + 0.9\log(iss4); \quad (2)$$

$$y(2014) = -9.108 + 0.494\log(iss3) + 0.916\log(iss4); \quad (3)$$

$$y(2015) = -10.643 + 0.395\log(iss3) + 1.1\log(iss4); \quad (4)$$

$$y(2016) = -11.782 + 0.368\log(iss3) + 1.23\log(iss4); \quad (5)$$

$$y(2017) = -9.848 + 0.417\log(iss3) + 1.01\log(iss4). \quad (6)$$

Analysis of the standardized residual errors confirms that Y is fairly normally distributed. The distribution varies slightly from year to year, but is normal.

The histograms of the standardized residual errors differ slightly from the normal curve. The relative percentage frequencies (P – P plot) of the standardized residual errors and the normal random variable are fairly normally distributed (closer to the line). The analysis confirms that the requirement for normality of standardized residual errors is met.

Regression analysis models of the impact of tourism innovation on capital investment in the tourism sector reveal that a 1% increase in the number of employed ICT specialists increases capital investment in the tourism sector by 0.37–0.49%, self-service increase by 1% increases capital investment in the tourism sector by 0.9–1.23%. Influence of self-service degree on capital investments in the tourism sector in 2015–2017 decreased almost ten times compared to 2012–2014. The models reveal that the number of ICT professionals employed in the tourism sector has a four to five times greater impact on capital investment than the degree of self-service.

Conclusions

1. Due to the specificity of the services sector, innovations of services differ from innovations of production in six aspects: services innovations are customer-oriented; based on skills and communication between organisations; social and organisational nature of innovation, less structured implementation of innovation and maintenance of activities, employee involvement in innovation are common. In the general context of the concept of innovation, the implementation of innovativeness is similar in both the production and services sectors due to the same goals and results. Often, product and services innovations are integrated, thereby making the boundary between them difficult to identify.

2. The development of innovativeness in the tourism sector is due to rapid technological progress and the availability of technology. Technologies in the tourism sector help to enable technological devices that are mostly owned by consumers: computers, smartphones, and tablets. Meanwhile, tourism businesses can more easily manage relationships with customers, provide individualised offers, optimise supply and demand, and make right business decisions. Tourism innovativeness enables the consumer to choose a new type of tourism services. They can be more easily managed by service providers. This is changing the tourism market, which has a different economic impact. Innovativeness in the tourism sector has an economic impact on the following areas: investment, job creation, national product, the country's balance of payments and as a levelling function.

3. The novelty of this study is related to the assessment of tourism innovation at the level of European countries. Positive economic impact of tourism innovativeness in the European countries in 2012-2017 has been determined: on the basis of the correlation analysis and after the removal of multicollinear indicators, 5 indicators of tourism innovativeness (air transport infrastructure, penetration of innovation in transport and accommodation companies, number of employed ICT specialists, the degree of self-service, digital country index) have been found to correlate with indicators of capital investments. Regression analysis models of the impact of tourism innovativeness on capital investment in the tourism sector reveal that a 1% increase in the number of employed ICT specialists increases capital investment in the tourism sector by 0.37–0.49%, self-service increase by 1% increases capital investment in the tourism sector by 0.9–1.23%. Influence of self-service degree on capital investments in the tourism sector in 2015–2017 decreased almost ten times compared to 2012–2014. The models reveal that the number of ICT professionals employed in the tourism sector has a four to five times greater impact on capital investment than the degree of self-service.

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